

Remarks

Claim Rejections – 35 USC § 112

The Office has rejected claims 52 and 63 as being indefinite for failing to particular point out and distinctly claim the subject matter which applicant regards as the invention. Claims 41 from which claim 52 depends and 63 have been amended to overcome this rejection, namely to provide an antecedent basis for the terms “learnt database” in claim 63 and “new drives” in claims 52.

Claim Rejections – 35 USC § 102

The Office has rejected claims 41, 48, 49, 52, 56, 63, 64 and 66 as being anticipated by United States Patent Number 6,385,454 awarded to *Bahl* et al. The applicants respectfully traverse these rejections and submit that the claims are actually allowable over *Bahl*.

At the onset, the applicant points out that *Bahl* is directed towards a method of increasing handoff efficiency and not for determining the physical location of a vehicle. As such, *Bahl* teaches a technique that is based on the position of the mobile unit (MU) over time relevant to the cellular network topology and prediction of its route (i.e. the next cells) within this network. This technique is achieved by keeping past cell sequences of the same MU and finding the best match to determine the route of the MU within the network and predict the next cells for that MU.

The route with reference to the network topology can be very helpful for increasing handoff efficiency (which is the target of the *Bahl* patent), however it is, by itself, not sufficient for determination of the location (physical position on the ground) of a vehicle.

In contrast to *Bahl*, the present invention as recited in claim 41 operates to correlate a vehicle with the road on which it travels based on cellular communication. The recited method includes not only gathering cellular related information but also correlating this information in time with actual geographic or physical locations of the vehicle. Thus, the present invention as recited in claim 41 operates to identify the actual physical location with reference to geographic information, not with relationship to the topology of the cellular network. The Office seems to indicate that identifying the time that cellular handoffs occur is the same as correlating cellular events in time with actual geographic or physical locations. However, this simply is not the case and *Bahl* does not describe, suggest or teach this aspect as recited in claim 41.

Thus, the applicants respectfully submit that claim 41 is allowable over the cited art and requests the Office to reconsider its rejection.

Further, because claims 48, 49, 52, 56, 63, 64 and 66 all depend either directly or indirectly from claim 41, these claims are also in condition for allowance and the particular basis of the Office's rejections do not need to be addressed.

Similarly, claim 63 recites the use of traffic volume information collected for each route from external sources. Again, similar to claim 41, *Bahl* does not teach such physical characteristics of the traffic and as such, claim 63 is also allowable.

However, to further assist the Office in its examination of these claims, the applicants submit the following tutorial which compares aspects of the present invention with the technology described in *Bahl*. Please understand that the claims, specifically claim 41 is not limited in any manner by the tutorial description being provided. Rather, this description is provided to simply illustrate the overall operation of the various aspects of the present invention and to facilitate a better understanding by the Office.

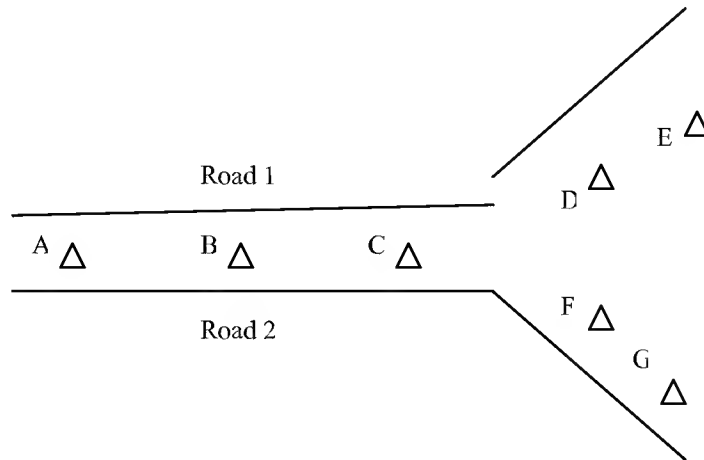
To differentiate between the network positioning as taught in *Bahl* and the geographic location and its implications as reflected on *Bahl* and the current invention, the following simple example can be studied:

Figure 1 shows 2 roads, road 1 and road 2, that run in parallel for some distance and then diverge. There are several cells (triangles) A, B and C that serve the 2 roads and then, after the roads diverge, road 1 is served by cells D and E whereas road 2 is served by cells F and G. If 2 calls take place on the parallel section, call 1 on road 1 and call 2 on road 2, these 2 calls will generate, according to *Bahl*, the same User's Mobility Pattern (UMP) which will be the sequence A, B, C which does not differentiate between roads. This sequence implies just the route within the cellular network topology, and does not contain any data related to the geographic location of the handovers across this route. Furthermore if a UMP exists for the whole of road 1 i.e. A, B, C, D, E, and no UMP exists for road 2, and the User's Actual Path (UAP) of a vehicle driving on road 2 has the sequence A, B, C then *Bahl* will predict D, E as the next cells to serve this MU whereas the next cells across road 2 will actually be F, G.

The current invention teaches test driving of the 2 roads with vehicles equipped with a cellular phone and a geographic location device such as GPS, so the geographic locations of handovers between the different cells are known. Furthermore, if we assume a similarity rule of 2 out of 3, the sequences (A, B, C), (B, C, E) and (B, C, F) will be filtered out of the clusters created for the roads as ambiguous, since they are similar for the 2 roads, while sequences (C, D, E) and (C, F, G) will not be filtered since each of them indicates one specific

road - road 1 for (C, D, E) and road 2 for (C, F, G). In addition another aspect of the current invention is a mechanism that enables, once a road has been identified using the unique clusters, to search for similarities forward and backward using the raw data for this road, thus determining the exact geographic location of the vehicle on the right road even for close and parallel roads.

Figure 1



Bahl does not describe, suggest or teach identification of the road that the vehicle is traveling over, and if the same sequence can serve two roads – *Bahl* will treat these as the same route in the imaginary space of network topology, while the present invention focuses on differentiating such phenomena and avoiding such ambiguity.

Allowable Subject Matter

The Office has indicated that claims 42-46, 51, 53, 54, 58-62, 65 and 67 are objected to but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

However, the applicant has traversed the rejection of claim 41 from which each of these claim either directly or indirectly depends. As such, the applicants respectfully submit that these claims are also in condition for allowance as is and requests the Office to reconsider its objections to these claims.

Conclusion

The applicants respectfully submit that each and every issue raised in the Office Action has been addressed and that the claims, as presented herein are in condition for allowance. The applicant respectfully requests the Office to carefully consider the remarks and amendments presented herein and to move this case towards allowance. If the Office has any questions, a telephone call to the applicant's attorney at (404) 643-3430 or an email to the same at gsmith@lavagrouplaw.com is respectfully requested.

With the kindest regards
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